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FAB 3

NATURAL AND SYNTHETIC SWEETENERS

SELECTED FROM VOLUME 9
FOOD SCIENCE AND TECHNOLOGY ABSTRACTS

er the direction of

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Copies of all original articles referred to in the abstracts may be bought (or occasionally borrowed) from the International Food Information Service. A form for ordering these is provided at the end of this FAB.

Coverage of the subject has been restricted to that of Food Science and Technology Abstracts, which covers over 1200 of the important food journals, patents from 20 countries and books published world-wide. Every effort is made to include all significant references, but editorial discretion is used on the many articles of borderline interest. If the reader particularly needs an exhaustive search of the subject, we will be pleased to provide any other references that we have available. We would, in any case, encourage readers to write or telephone us with any comments or queries that they may have.

H. BROOKES
ASSISTANT EDITOR

1 Pyrolysis GLC identification of food and drug ingredients. I. Saccharin.

Szinai, S. S.; Roy, T. A.

Journal of Chromatographic Science 14 (7) 327-330 (1976) [7 ref. En] [Univ. of Florida, Coll. of Pharmacy, Box 779, Gainesville, Florida 32610, USA]

Pyrolysis GLC, used in the qualitative analysis of saccharin, has provided reproducible pyrograms which permit direct characterization of these sweeteners in a variety of commercial saccharin tablets and diet beverages. This method was used also to identify the salt, after conversion to the free imide, in a commercial multivitamin product. The tablet analysis required isolation by solvent extraction. Analyses were carried out on quantities ranging from 1 to 100 µg. The sensitivity of the method could be increased by addition of a pure sample of the compound sought to the unknown. AS.

2

[A sensory method for determination of the optimum composition of foods in which alternative ingredients are to be substituted.] Eine sensorische Methode zur Ermittlung der geschmacklich optimalen Zusammensetzung von Lebensmitteln bei Austausch von Inhaltsstoffen.

Hoppe, K.

Nahrung 20 (6) K7-K9 (1976) [4 ref. De]

A sensory procedure based on the Evolutionary Operations method for evaluation of the optimum level of substitution of ingredients in foods is described; as an example, a description is given of detn. of the optimum concn. of saccharin in a beverage in which the sugar concn. was reduced by 40%. IN

3

[Glucose syrup and fructose as sweeteners for soft drinks.] Glukosesirup und Fruktose als Süßungsmittel für Getränke.

Ellerich, E.

Brauwelt 116 (19) 572-574 (1976) [De, en, fr]

[Firma Rudolf Wild, 6900 Heidelberg, Federal Republic of Germany]

Use of glucose syrups, fructose or isomerose (high-fructose starch syrup) for sweetening of soft drinks is discussed, with reference to: physico-chemical properties; relative sweetness; effects of temp. and concn. on sweetness; functional properties; storage; viscosity; effects on the taste of the product; costs; and legal aspects in various countries. TUB-IGB

4

Long-term and multigeneration toxicity studies with cyclohexylamine hydrochloride.

Oser, B. L.; Carson, S.; Cox, G. E.; Vigin, E. E.; Sternberg, S. S.

Toxicology 6 (1) 47-65 (1976) [12 ref. En]

[Food & Drug Res. Lab. Inc., E. Orange, New Jersey, USA]

Cyclohexylamine (CHA) is a metabolite of the sweetener, cyclamate, produced in varying quantities by gastro-intestinal microorganisms. CHA was fed at ≤ 150 mg/kg body wt. to FDR strain rats over 5 generations. No dose related histological, pathological or teratogenic effects were observed due to feeding CHA at these levels. JRR

5

[Sensory evaluation of stevioside as a sweetener.] Isima, N.; Kakayama, O.

Report of the National Food Research Institute [Shokuryo Kenkyusho Kenkyu Hokoku] No. 31, 80-85 (1976) [13 ref. Ja, en] [Nat. Food Res. Inst., 1 Shiohama 4-12, Kotoku, Tokyo, Japan]

Stevia rebandiana Bertoni is a Paraguayan weed containing an intensely sweet principle named stevioside, which may have potential as a sweetener to replace sucrose or saccharin. Organoleptic tests with trained panels, using a newly developed 'incomplete paired comparison' test routine showed that highly refined stevioside (93-95%) had a long aftertaste and some bitterness and astringency not found in less pure (50%) preparations. Sweetness intensity of stevioside was 300 times that of 0.4% sucrose, 150 times that of 4% sucrose and 100 times that of 10% sucrose. Stevioside mixed with acetic acid, citric acid or salt had similar taste properties, but mixing with sucrose, fructose or glucose improved its unpleasant sweetness. [From En summ.] JRR

6

Enhancement in the sweetness of sucrose.

Hough, L.; Phadnis, S. P.

Nature, UK 263 (5580) 800 (1976) [6 ref. En] [Dep. of Chem., Queen Elizabeth Coll., Univ. of London, London W8 7AH, UK]

It is reported that 1',4,6,6'-tetrachloro-galactosucrose is intensely sweet, comparable with saccharin but without an unpleasant after-taste. In the development of alternative sweeteners from sucrose, e.g. in dietetic and low-calorie foods, the chloro derivatives are thought to be worthy of further evaluation. The material in this publication is included in British Patent Applications No. 616/76 and 19 570/76. AL

7

Chemicals in food.

Hai, S. M. A.

Science Chronicle 13 (3) 160-162 (1975) [En]

This paper briefly discusses various aspects relating to the use of food additives, including reasons for their use, their safety, evaluation in animal feeding tests, and roles of particular additives (e.g. monosodium glutamate, saccharin and other sweeteners, citric and other acids, emulsifiers, Ca and Na salts, antioxidants). Mention is also made of the use of ionizing radiation in food processing. JA

8

New sweeteners. [Review]

Crosby, G. A.

CRC Critical Reviews in Food Science and Nutrition 7 (4) 297-323 (1976) [86 ref. En]
[Dynapol, Palo Alto, California, USA]

The progress made in the search for new, non-toxic, non-nutritive sweeteners since cyclamate was banned by the US FDA in 1969 is reviewed. The subject is discussed with reference to natural products (e.g. monellin, miraculin), dipeptide sweeteners (e.g. aspartame) and alkoxyaromatic sweeteners (e.g. dihydrochalcones). JRR

9

[Thiphene saccharins.] Thiophensaccharine.

Hromatka, O.; Binder, D. BASF AG

German Federal Republic Patent Application 534 689 (1976) [De]

Structural formulae are shown of 3 new thiophene-saccharins, with the SO₂-NH-CO ring in 3 different positions relative to the S atom in the thiophene ring. These have a high sweetening power (one of them extremely high) with no side taste; they are non-toxic and can also be prepared as water-soluble salts. W&Co

10

On the gustatory effects of gymnemic acid and miraculin in dog, pig and rabbit.

Hellekant, G.

Chemical Senses and Flavor 2 (1) 85-95 (1976)
[26 ref. En] [Dep. of Physiol.,
Veterinärhögskolan, HVC, 750 07 Uppsala,
Sweden]

The effects of gymnemic acid, 1 mg/ml, and miraculin, 1 mg/ml or in a tablet (Miralin), on the taste response to sucrose, citric acid, NaCl and quinine were studied in dog, pig and rabbit. In the dog, gymnemic acid suppressed the response to sucrose for about 5 min in 2 out of 3 animals. It also affected the response to NaCl. Miralin caused a slight short-lasting increase in the response to acid. No effects of the taste modifiers were observed in the pig. In the rabbit, gymnemic acid did not suppress the response to sucrose while miraculin enhanced the response to citric acid in 1 out of 3 animals for a few min. AS

11

On the gustatory effects of monellin and thaumatin in dog, hamster, pig and rabbit.

Hellekant, G.

Chemical Senses and Flavor 2 (1) 97-105 (1976)
[15 ref. En] [Dep. of Physiol.,
Veterinärhögskolan, HVC 750 07 Uppsala 7,
Sweden]

The electrical activity in the chorda tympani proper nerve of dog, hamster, pig and rabbit was recorded during stimulation of the tongue with the sweet proteins, monellin and thaumatin, and stimuli

representing the 4 taste qualities. It was observed that these proteins, which to man taste extremely sweet and in the monkey elicit a significant neural response, caused, except for monellin in the dog, no significant change in the neural activity. On the basis of these results it is suggested that different types of 'sweet' receptor sites exist in mammals. AS

12

[Acetosulpham, a new sweetener. I. Synthesis and properties.] Acetosulfam, ein neuer Süßstoff. I. Herstellung und Eigenschaften.**Zeitschrift fuer Lebensmittel-Untersuchung und -Forschung** 162 (1) 37-40 (1976) [2 ref. De, en]
[Hoechst AG, Postfach 800 320, D-6230 Frankfurt
(Main) 80, Federal Republic of Germany]

A survey is made of the synthesis, chemical and physical properties, and hydrolytic stability of the new sweetener acetosulpham (3,4-dihydro-6-methyl-1,2,3-oxathiazin-4-one-2,2-dioxide potassium salt). AS

13

Subacute toxicity studies with sodium saccharin and two hydrolytic derivatives.**Toxicology** 6 (2) 133-138 (1976) [5 ref. En]
[Ind. BIO-TEST Lab. Inc., 1810 Frontage Road,
Northbrook, Illinois 60062, USA]

The subacute toxicity of sodium saccharin, o-sulphonylbenzoic acid and ammonium o-carboxybenzene sulphonate was evaluated in beagle dogs and rats by feeding at 20 000 ppm alone or in combinations for a period of 16 wk. No pharmacotoxic effects were observable in the test group; it is suggested that ingestion of the derivatives is associated with little toxicological hazard. JRR

14

[Which sweeteners are available for use by diabetics.] Welche Zuckeraustauschstoffe und Süßungsmittel stehen den Diabetikern zur Verfügung?

Sodemann, K.

Ernährungsforschung 21 (3) 78-80 (1976) [2 ref. De] [Zentralinst. für Diabetes "Gerhardt Katsch", Karlsruhe, German Democratic Republic]

Sweeteners discussed include sorbitol, fructose, xylitol, saccharin and cyclamates; aspects considered include sweetness, cost, side effects, toxicity, and current legal status in the German Democratic Republic. IN

15

[Gas chromatograph equipped with flame photometric detection system for the determination of saccharin.]

Ito, Y.; Tonogai, Y.; Iwaida, M.

Journal of the Food Hygienic Society of Japan

[*Shokuhin Eiseigaku Zasshi*] 17 (1) 89-94 (1976)
 [18 ref. Ja, en] [Nat. Inst. of Hygiene Sci., Osaka Branch, Hoenzaka-cho, Higashi-ku, Osaka, Japan]

Saccharin was either methylated or silylated to provide a volatile derivative for GC (gas chromatography). Among the 4 esterification methods compared, methylation with methyl iodide was found to be the most sensitive, while methylation with diazomethane gave excellent reproducibility. With the flame photometric detection system of GC, sodium saccharin at 0.2 µg/ml level could be detected, which was about 200 times more sensitive than a flame ionization detector for GC. Sodium saccharin contents of commercial soy sauce products were 0-14 ppm.
 TM

16

[Metabolism of food additives by microorganisms inhibiting the gastrointestinal tract. III. Suitable medium for the production of cyclohexylamine from sodium cyclamate by sodium cyclamate assimilating bacteria under anaerobic culture conditions.]

Matsui, M.; Hayashi, N.; Tanimura, A.; Kurata, H.
Journal of the Food Hygienic Society of Japan
 [*Shokuhin Eiseigaku Zasshi*] 17 (1) 48-53 (1976)
 [31 ref. Ja, en] [Nat. Inst. of Hygiene Sci., Kamiyoga 1-chome, Setagaya-ku, Tokyo, Japan]

A suitable medium for the detection of sodium cyclamate assimilating bacteria from faeces and caecal contents of animals was investigated. The modified BC medium containing 0.25% of sodium cyclamate adjusted to pH 8.0 showed the best results. TM

17

[Metabolism of food additives by microorganisms inhibiting the gastrointestinal tract. IV. Fate of faecal flora in monkeys administered orally with sodium cyclamate and the detection of sodium cyclamate assimilating bacteria in vitro by anaerobic culture.]

Matsui, M.; Hayashi, N.; Konuma, H.; Tanimura, A.; Kurata, H.
Journal of the Food Hygienic Society of Japan
 [*Shokuhin Eiseigaku Zasshi*] 17 (1) 54-58 (1976)
 [21 ref. Ja, en] [Nat. Inst. of Hygiene Sci., Kamiyoga 1-chome, Setagaya-ku, Tokyo, Japan]

See preceding abstr.

18

[Maltose sweeteners.]

Meiji Seika Co. Ltd.

Japanese Patent 5 120 575 (1976) [Ja]

Maltose-based sweetening compositions are produced by reacting amylase with starch-based substances. IFT

19

Multifunctional sweetener.

Fruda, I.; Trumbetas, J. F. General Foods Corp.
United States Patent 3 971 857 (1976) [En]

Phosphoric acid is added to a heated solution of glucose to catalyse polymerization. The solution is evaporated to form an acidified glucose syrup, which is vacuum heated and dried. IFT

20

Aspartyl amide sweetening agents.

Chibata, I.; Miyoshi, M.; Ito, H.; Fujii, T.; Kawashima, K. Tanabe Seiyaku Co. Ltd.

United States Patent 3 971 822 (1976) [En]

21

[Analysis of L-aspartyl-L-phenylalanine methyl ester.]

Nizhizima, M.; Kanmuri, M.; Takahashi, S.; Kamimura, H.; Nakazato, M.; Watari, Y.; Kimura, Y.

Journal of the Food Hygienic Society of Japan
 [*Shokuhin Eiseigaku Zasshi*] 17 (1) 78-84 (1976)
 [9 ref. Ja, en] [Tokyo Metropolitan Res. Lab. of Public Health, 3-chome, Hyakunincho, Shinjuku-ku, Tokyo, Japan]

An analytical method for detn. of APM (L-aspartyl-L-phenylalanine) sweetener in foods was investigated. For qualitative analysis of APM by TLC, the sample was dialysed using a cellulose tube against water or extracted with methanol. APM in the outer solution obtained by dialysis or the methanol extraction was separated by TLC using silica gel or a cellulose plate. An APM spot was detected under UV light after spraying with fluorescamine reagent. The sensitivity limit was 12 ng of APM on the TLC plate. For quantitative analysis, high speed liquid chromatography was carried out. TM

22

Potential new artificial sweetener from study of structure-taste relationships.

Acton, E. M.; Stone, H.

Science, USA 193 (4253) 584-586 (1976) [11 ref. En] [Standard Res. Inst., Menlo Park, California 94025, USA]

4-(Methoxymethyl)-1,4-cyclohexadiene-1-carboxaldehyde syn-oxime is a new sweetening agent developed by systematic synthesis and taste evaluation of 80 new oximes analogous to the little-used oxime sweetener, perillartine. AS

23

[A new sweetener - acetosulfam.] Acetosulfam - ein neuer Süßstoff für die Verwendung in Mundkosmetika.

Rymon Lipinski, G.-W. von; Lück, E.; Dany, F.-J.
Seifen-Oele-Fette-Wachse 102 (9) 243-244

(1976) [De] [Hoechst AG, 6230 Frankfurt (M)
80, Federal Republic of Germany]

Properties and applications of acetosulfam (the K salt of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one-2,2 dioxide) as a sweetener for foods and oral cosmetics are briefly described. It is freely soluble in water, alcohol and glycerol-water mixtures, stable during prolonged storage (e.g. during several months at room temp. and pH 3-8) and sterilization, showed no toxic effects after long-term ingestion at high levels, and no off-flavours at normally used concn. It was found acceptable in beverages, bakery products, desserts, mayonnaise, etc. RM

24

[Determination of the weight loss of saccharin on drying.] Zur Bestimmung des Trocknungsverlustes von Saccharin.]

Kreutzig, L.

Deutsche Lebensmittel-Rundschau 72 (9) 318-320 (1976) [10 ref. De, en, fr] [Chem.
Untersuchungslab., Frankfurter Strasse 60, 3500
Kassel, Federal Republic of Germany]

Comparative studies on the wt. loss of saccharin during drying for 14 h at 105°C (as required in most pharmacopoeias) and at 150°C (as required in the regulations for dietetic foods in the Federal Republic of Germany) are described. 2 saccharin samples were studied. Wt. losses during drying for 14 h at 105°C were 99.46-99.82% (constant wt. being reached). Wt. losses during drying at 150°C were 95.00-96.94% (constant wt. not being reached). It was found that significant sublimation of saccharin occurs at 150°C; it is, therefore, concluded that drying at this temp. is not a suitable test method for saccharin. AJDW

25

Enzymatic proteolysis of monellin. Absence of sweet peptides.

Morris, J. A.; Cagan, R. H.

Journal of Agricultural and Food Chemistry 24 (5) 1075-1077 (1976) [11 ref. En] [Monell Chem.
Senses Cent., Univ. of Pennsylvania, Philadelphia,
Pennsylvania 19104, USA]

Enzymic proteolysis of the sweet-tasting protein monellin with trypsin, α-chymotrypsin, or bromelain failed to produce a sweet-tasting fragment. Monellin is relatively resistant to proteolysis, but prolonged digestion with excess enzyme does result in production of non-sweet fragments. AS

26

A process for the preparation of sweeteners or sweetened foods and beverages.

Hayashibara Seibutsu

British Patent 1 440 257 (1976) [En]

Maltitol and/or lactitol is added to sucrose sweetening compositions to inhibit absorption of sucrose. IFT

27

Impurities in commercial saccharin. I. Impurities soluble in organic solvents.

Stavric, B.; Klassen, R.; By, A. W.

Journal of the Association of Official Analytical Chemists 59 (5) 1051-1058 (1976) [19 ref. En]
[Toxicology Res. Div., Health Protection Branch,
Health and Welfare Canada, Ottawa, Ontario K1A
OL2, Canada]

13 saccharin samples used for carcinogenicity tests in animals in various laboratories were analysed for their chemical purity. Although most impurities were water-soluble, some were mainly soluble in organic solvents. These impurities were extracted with chloroform-methanol from a water solution of sodium saccharin. Samples obtained as acid-saccharin were converted to the sodium form before extraction. The major impurity in commercial saccharin, o-toluenesulphonamide, was also soluble in this system. Impurities were separated by GLC of the underivatized, conc. extract. 11 major, well separated peaks were collected from the GLC column and identified by MS. Some of the peaks were compared with known standards. Qualitative and quantitative differences in impurities were observed among different saccharin samples. The identified impurities (in order of appearance from the GLC column) were as follows: o-toluenesulphonamide; p-toluenesulphonamide; 1,2-benzisothiazole 1,1-dioxide; 1,2-benzisothiazoline 1,1-dioxide; diphenylsulphone; o,o'-ditolylsulphone; o,m'-ditolylsulphone, o,p'-ditolylsulphone; m,p'-ditolylsulphone; p,p'-ditolylsulphone, and tetracosane. AS

28

Recent developments in sweeteners.

Breen, N.

Food Progress 3 (4) 1-2 (1976) [17 ref. En]

This review-type article discusses the sources, synthesis, sweetening power, taste, applications and other properties (e.g. acid and heat resistance) of high-intensity sweeteners and carbohydrate sweeteners. High-intensity sweeteners include protein sweeteners (e.g. aspartame, monellin, thaumatin I and II, miraculin), dihydrochalcone sweeteners, acetosulpham (an oxathiazinone dioxide), and oxime V. The carbohydrate sweeteners include pure fructose, xylitol, maltitol and high-fructose corn syrup. JA

29

Artificial sweeteners.

Crosby, G. A.; Dubois, G. E. Dynapol

United States Patent 3 976 790 (1976) [En]

Artificial sweetening compositions containing ionic dihydrochalcone compounds are 500× as sweet as sucrose and are used in soft drinks and chewing gums. IFT

30

Ionic sweetener.

Crosby, G. A.; Dubois, G. E.; Weinshenker, N. M.
Dynapol

United States Patent 3 974 299 (1976) [En]

Dietetic sweeteners containing ionic dihydrochalcone compounds are very water soluble so that intense sweet flavours can be generated with no appreciable aftertaste. IFT

31

Anthocyanins and flavonols of miracle fruit,

Synsepalum dulcificum, Schum.

Buckmire, R. E.; Francis, F. J.

Journal of Food Science 41 (6) 1363-1365 (1976)

[15 ref. En] [Dep. of Food Sci. & Nutr., Univ. of Massachusetts, Amherst, Massachusetts 01002, USA]

The anthocyanin and flavonol pigments of the miracle fruit were isolated and identified by paper chromatography and spectral analysis. The red pigments (14.3 mg/100 g fresh wt.) were cyanidin-3-monogalactoside, cyanidin-3-monoglucoside, cyanidin-3-monoarabinoside, delphinidin-3-monogalactoside and delphinidin-3-monoarabinoside existing in a ratio of 188:62:9:5:2. The major flavonol pigments were quercetin-3-monogalactoside, kaempferol-3-monoglucoside, myricetin-3-monogalactoside and traces of similar flavonols. The aglycones quercetin, kaempferol and myricetin were also isolated and identified. The flavonols and aglycones were present at 9.0 mg/100 g fresh wt. IFT

32

High-performance liquid chromatographic

determination of L-aspartyl-L-phenylalanine

methyl ester in various food products and

formulations.

Fox, L.; Anthony, G. D.; Lau, E. P. K.

Journal of the Association of Official Analytical

Chemists 59 (5) 1048-1050 (1976) [6 ref. En]

[Quality Control Dep., Searle Lab., Div. of G. D. Searle & Co., PO Box 5110, Chicago, Illinois 60680, USA]

A simple, rapid and specific high-performance liquid chromatographic (HPLC) procedure is described for analysis of the chemical sweetener L-aspartyl-L-phenylalanine methyl ester (aspartame). Using a strong cation exchange column and pressures <1000 lb/in² (gauge), an analysis can be performed in <15 min. The technique has been applied to a wide range of food products and formulations. No interferences were found in the samples studied. Recoveries are quantitative, and the coeff. of variation for replicate analyses are 2.5%. AS

33

[Additives for yoghurt.]

Spain, Dirección General de Sanidad

Revista Espanola de Lecheria No. 10i, 198-199 (1976) [Es]

Permitted colours, sweeteners, stabilizers and preservatives (with the max. permitted concn.) for addition to yoghurt are listed, as approved by a resolution of the Spanish General Directorate of Health dated 21 April 1976. They may be used only in yoghurt with fruit, juice and/or other natural products, and in flavoured yoghurts. ADL

34

Summer school 74 - proceedings in sensory analysis of odour and taste. [Conference proceedings]

Poland, Polish Academy of Sciences, Committee of Food Chemistry & Technology

Acta Alimentaria Polonica 2 (3) 109-244 (1976) [many ref. En, pl]

[Continued from preceding abstr.] Determination of odour absolute threshold of some sulphur compounds, by E. Pietrzak & N. Barylko-Pikielna (pp. 207-212, 5 ref.); Main group components of aroma in amino acid-sugar model systems, by Z. Mielniczuk, N. Barylko-Pikielna & M. Daniewski (pp. 213-221, 15 ref.); Some comments on the vibrational theory of olfaction, by K. B. M. Miler (pp. 223-231, 27 ref.); Stereostructure of sugars and sugar derivatives influencing their taste properties, by A. Kurkowska-Mielczarek (pp. 233-234, ref.); Recent progress in sensory methods, by N. Barylko-Pikielna (pp. 235-237); Instrumental vs. sensory analysis of odorous substances: possibilities and limitations, by K. B. M. Miler & N. Barylko-Pikielna (pp. 239-240); and Sensory characteristics of volatile substances of microbial origin separated by gas chromatography, by E. Kaminski, S. Stawicki & A. Niewiarowicz (pp. 241-242). A further 4 papers are abstracted separately and are in the author index under Poland, Polish Academy of Sciences, Committee of Food Chemistry & Technology [Sensory Analysis Symposium]. AL

35

Effect of acetylation and methylation on the

sweetness intensity of thaumatin I.

Wel, H. van der; Bel, W. J.

Chemical Senses and Flavor 2 (2) 211-218 (1976)

[10 ref. En] [Unilever Res., Vlaardingen, Netherlands]

The lysine residues in thaumatin I were chemically modified by acetylation with acetic anhydride and by reductive methylation, under various conditions. The acetylated and methylated thaumatins were isolated by ion-exchange chromatography. The number of remaining free amino groups was determined by trinitrophenylation. >4 acetylated thaumatins with either 1, 2, 3 or 4 acetylated amino groups were obtained as well as 1 methylated thaumatin with 6

dimethyl lysine residues and 1 monomethyl lysine residue. The sweetness intensity of the acetylated thaumatin decreased with the increasing number of acetylated amino groups; the sweet taste had disappeared completely when 4 amino groups were acetylated. The methylated thaumatin with 7 modified lysine residues had a sweetness intensity practically equal to that of the original thaumatin. The total net charge, i.e. the isoelectric point of thaumatin, might play a role in the physiological behaviour of thaumatin causing a sweet taste sensation. AS

36

[Improved methods for the production of sugar confectionery for diabetics.]

Marshalkin, G. A.; Lan'shina, T. S.; Popova, Yu. I. *Khlebopekarnaya i Konditerskaya Promyshlennost'*. No. 4, 26-28 (1976) [Ru]

For the production of confectionery containing xylitol, sorbitol and water for diabetic patients, the solubility of xylitol in the presence of sorbitol was studied at various temp., together with the bp of mixed xylitol-sorbitol solutions. From the sensory point of view the most suitable composition was found to be 75 kg xylitol, 25 kg sorbitol, and 25 kg water. These practical results agreed with those obtained using a mathematical (graph) method used in the manufacture of confectionery from sucrose and starch syrup, and which may therefore also be applied to xylitol-sorbitol solutions. STI

37

Chewing gums of longer lasting sweetness and flavour.

Bahoshy, B. J.; Klose, R. E.; Nordstrom, H. A. General Foods Corp.

United States Patent 3 982 023 (1976) [En]

The normal sweetness and flavour of gums containing non-dipeptide artificial sweeteners is extended by the incorporation of L-aspartyl L-phenylalanine methyl ester. IFT

38

[Sweeteners and diabetes.]

Heraud, G.

Alimentation et la Vie 64 (1) 14-23 (1976) [Fr]

The first part of this paper discusses recent findings relating to the perception of taste, including: the theory of Shallenberger & Acree on molecular structure and sweet taste [FSTA (1969) 1 12L652]; inter-reactions between glucophore structure and lingual papillae; lingual receptors of sweet taste; proteins sensitive to lingual receptors; and the application of these findings to diabetic diets. The second part discusses the use of chemical sweeteners (e.g. saccharin, cyclamic acid, cyclamates) in diabetic diets. JA

39

Dietetic sweeteners.

Westall, E. B.; Messing, A. W. Nutrilite Products Inc.

United States Patent 3 984 394 (1976) [En]

Dietetic sweeteners comprise monobasic metal salts of dihydrochalcones. IFT

40

Long-term toxicity of cyclohexylamine hydrochloride in the rat.

Gaunt, I. F.; Hardy, J.; Grasso, P.; Gangolli, S. D.; Butterworth, K. R.

Food and Cosmetics Toxicology 14 (4) 255-267

(1976) [32 ref. En] [British Ind. Biol. Res. Ass., Woodmansterne Rd., Carshalton, Surrey SM5 4DS, UK]

Investigations were carried out into the toxicity and carcinogenic potential of cyclohexylamine, a metabolite of the cyclamate sweeteners. Groups of 48 rats of each sex were given diets containing 0, 600, 2000 and 6000 ppm cyclohexylamine hydrochloride (CHAH) for 2 yr. On the basis of detailed physiological findings, it was concluded that CHAH at levels \leq 6000 ppm in the diet did not show any carcinogenic potential and that the no-untoward-effect level was 600 ppm. VJG

41

Alternative sweetening agents. [Lecture]

Palmer, T. J.

Food Processing Industry 45 (540) 23-24, 71 (1976) [En]

Sweetening agents for food products briefly considered are: sucrose; glucose syrups and dextrose; invert sugars and fructose; polyhydric alcohols; and saccharin. Combination effects, subjective sweetness and future trends are also discussed. VJG

42

Xylitol - a sweetener which is kind to the teeth.
Counsell, J. N.

Food Processing Industry 45 (540) 24, 26 (1976) [En]

Consideration is given to xylitol, its occurrence in nature, its commercial production, its properties and its potential applications. These include: incorporation in a number of foods because of its non-cariogenic properties; and its resistance to caramelization and therefore its use in foods where min. browning during cooking is desirable. Dental studies with xylitol carried out over a 2 yr period at the University of Turku, Finland, are discussed. VJG

43

Liquid chromatography of neohesperidin dihydrochalcone.

Schwarzenbach, R.

Journal of Chromatography 129, 31-39 (1976)

[12 ref. En] [Givaudan Res. Co. Ltd.,

Ueberlandstr. 138, Ch-8600 Dübendorf,

Switzerland]

Neohesperidin dihydrochalcone (NHDC) is a non-nutritive sweetener (approx. 2000 times sweeter than sugar) of potential interest to the food industry, e.g. in soft drinks, yoghurt, chewing gum, and in foods which sugar is undesirable. A liquid chromatographic method developed for the detn. of impurities in NHDC and of NHDC in food products is described. It uses a reversed-phase chromatographic system with octadecyltrichlorosilane-treated silica gel as chemically bonded stationary phase and 40% methanol in water as mobile phase. Preparation of the packing material is simple and reproducible; a detailed procedure is given. Quantitative detn. of NHDC added to samples of tonic and cola showed good recovery. 4 analyses of a strawberry-flavoured skim-milk yoghurt sample containing 75 µg/g NHDC gave an average recovery of 74.7 µg/g (range 72-80 µg); 2 extractions with acetone were sufficient to remove the NHDC. For chewing gum, 3 aqueous extractions were necessary for quantitative detn. of NHDC. AL

44

[Temperature-dependent behaviour of D-fructose in aqueous solutions and during melting.]

Temperaturabhängiges Verhalten von D-Fructose in wässrigen Lösungen und Schmelzen.

Mauch, W.; Farhoudi, E. O.

Zeitschrift fuer die Zuckerindustrie 26 (12) 766-

771 (1976) [31 ref. De, en, es, fr] [Inst. für

Zuckerind., Amrumer Strasse 32, 1000 Berlin

(West) 65]

Temp. changes in the pyranose-furanose equilibrium of D-fructose in aqueous solution were studied. After completion of mutarotation, the tautomeric forms of fructose in equilibrium at 0°, 10°, 20°, 30°, 40° and 50°C were silylated and separated by GLC. The equilibrium mixture contained β-D-fructopyranose and α- and β-fructofuranose, but no α-D-fructopyranose or open ketal form. The concn. of the α- and β-furanose and β-pyranose forms changed linearly with temp., from 4.1, 11.1 and 84.8% at 0°C to 12.3, 31.9 and 55.8% at 50°C. The temp.-dependent correlation between pyranose-furanose concn., specific rotation and sweetness would explain the temp.-dependence of sweetness of fructose solutions, i.e. reducing sweetness with increasing conversion of pyranose to furanose. During melting, about 50% of fructopyranose is converted to furanose, reverting to pyranose during storage at a rate depending on temp. and moisture conditions. Reversible pyranose to furanose conversion may be the 1st phase of thermal decomposition of fructose. RM

45

[A new glucose syrup.]

Avebe-Amylum Italia

Industrie Alimentari 15 (12) 124-126 (1976) [It]

[Via C. Pisacane, 51-Milan, Italy]

A description is given of Isosweet, a glucose syrup with a high (>42%) fructose content and a very low (0.05%) mineral content, produced by an enzymic method and purified by ion exchange. Data are given on its chemico-physical composition, bacteriological characteristics (total count, yeasts, moulds), viscosity (150 cP), solubility, sweetening power (equal to sucrose), taste and colour. Applications include soft drinks, sweets, jellies and ice cream. HBr

46

Synthesis and taste of some analogs of neohesperidin dihydrochalcone.

Kamiya, S.; Esaki, S.; Konishi, F.

Agricultural and Biological Chemistry 40 (9) 1731-1741 (1976) [11 ref. En] [Dep. of Foods & Nutr., Shizuoka Women's Univ., Yada, Shizuoka City, Japan]

The following 10 new analogues of neohesperidin dihydrochalcone (dihydrochalcone = DHC) were synthesized: (i) hesperetin DHC-4'-β-L-quinovopyranoside, (ii) hesperetin DHC-4'-(α-L-quinovopyranosyl-(1→2)-β-D-glucoside), (iii) hesperetin DHC-4'-(β-L-quinovopyranosyl-(1→2)-β-D-glucoside), (iv) hesperetin DHC-4'-(α-L-quinovopyranosyl-(1→2)-β-D-galactoside), (v) hesperetin DHC-4'-(β-L-quinovopyranosyl-(1→2)-β-D-galactoside), (vi) hesperetin DHC-4'-(α-L-rhamnopyranosyl-(1→2)-β-D-galactoside), (vii) hesperetin DHC-4'-(α-L-mannopyranosyl-(1→2)-β-D-glucotide), (viii) hesperetin DHC-4'-(α-L-mannopyranosyl-(1→2)-β-D-galactoside), (ix) hesperetin DHC-4'-(α-D-mannopyranosyl-(1→2)-β-D-glucoside), and (x) hesperetin DHC-4'-(β-D-arabinopyranosyl-(1→2)-β-D-glucoside).

Compounds (i), (ii), (iv) and (vi) are 1.97, 3.4, 3.4 and 10.2 times sweeter than saccharin, respectively. From the organoleptic data, it is concluded that in the neohesperidin DHC molecule, methyl group and gauche conformation of vicinal glycol group at C 2 and 3 of L-rhamnose unit, and α1→2 linkage in rhamnosyl glucose are important requirements for the elicitation of intense sweet taste. [See also FSTA (1976) 8 2T48 & 4A194 and preceding abstr.] AS

47

Saccharin purification.

Nakaoji, K. Daiwa Kasei Co. Ltd.

United States Patent 3 988 344 (1976) [En]

Butyl acetate and a mixture of butyl acetate and ethyl acetate are used to extract organic impurities from aqueous solutions of saccharin. IFT

48

Containing lacticol as a sweetener.

**Hayashibara, K.; Sugimoto, K. Hayashibara Co.
United States Patent 3 973 050 (1976) [En]**

Lacticol is produced by adding, to a 30% aqueous solution of pure lactose, 8% Raney nickel as a reduction catalyst. The mixture is heated gradually to 100-130°C under constant stirring and when hydrogen is introduced at a pressure of 50-100 kg/cm², the mixture absorbs the hydrogen at a rate of 1 mol/mol of lactose. After cooling, the mixture is freed of the Raney nickel and is purified by use of active carbon and ion exchange resin. Following concentration, a lacticol solution in a colourless, transparent and viscous state is obtained which contains no direct reducing sugar and is comparable to dextrose in sweetness. It has no caloric value since it is not digested or absorbed by the digestive organs. Its use as a sweetening agent in a variety of foods, including carbonated drinks, fruit syrup, ice cream, cakes, canned foods, white wine and sweetened condensed milk is described. EJM

49

**Methods for the examination of ice cream:
sampling, physical and chemical tests.**

Israel, Standards Institution of Israel

**Israel Standard SI 859 Part I, 7pp. (1974) [En]
[42 University Street, Tel Aviv, Israel]**

The standard specifies apparatus, sampling methods, marking and storage of ice cream specimens, and describes the methods for detn. of wt./unit vol., content of sweetening agents (total sugars, lactose, other sugars, synthetic sweetening agents), protein content (by Kjeldahl (definitive method), or formol titration), and fat content (by Röse-Gottlieb (definitive method), or Gerber method). AL

50

Xylitol: anti-carie sweetener?

Russo, J. R.

**Food Engineering International 1 (4) 37-39
(1976) [En]**

This review-type paper discusses; the structure, occurrence and properties of xylitol; tests carried out in Finland which indicated a 90% reduction in the incidence of dental caries for people eating xylitol-containing foods in comparison with people eating sucrose-containing foods; the use of xylitol in chewing gum; FDA regulations concerning xylitol and its present status; and the performance of xylitol in various foods (beverages, chocolate, chewing gum, starch custard, milk drinks, bakery products, sugar-coated products, hard candy, jams, preserves, marinades, sauces, pastes) JA

51

Nonnutritive sweeteners: taste-structure relationships for some new simple dihydrochalcones.

DuBois, G. E.; Crosby, G. A.; Saffron, P

**Science, USA 195 (4276) 397-399 (1977) [9 ref.
En] [Chem. Synthesis Area, Dynapol, 1454 Page
Mill Road, Palo Alto, California 94304, USA]**

6 sweet and 5 non-sweet nonglycosidic dihydrochalcones were prepared; data for their sweetness (relative to sucrose) and their relative sour, salt, sweet and bitter taste scores are given, together with corresponding data for sucrose, sodium saccharin and sodium cyclamate. Structure/sweetness relationships in dihydrochalcones are considered, together with the time course of the sweetness sensation. 2 of the compounds studied had properties comparable to those of the intensely sweet neohesperidin dihydrochalcone. AJDW

52

Food additives. Saccharin and its salts.

United States of America, Food & Drug Administration

**Federal Register 42 (5, Jan. 7) 1461-1462 (1977)
[En] [Washington, DC, USA]**

The Food & Drug Administration is authorizing continued limited use of saccharin and its salts pending completion of toxicological studies underway in Canada (which also cover contaminant o-toluenesulphonamide, OTS) expected shortly after Jan. 1978. CAS

53

Structural relationships of sugars to taste. [Review]

Birch, G. G.

CRC Critical Reviews in Food Science and Nutrition 8 (1) 57-95 (1976) [144 ref. En] [Nat. Coll. of Food Tech., Univ. of Reading, Weybridge, Surrey, UK]

Chemical modification of sugars and their simple analogues indicates that these types of compound are almost always sweet, bitter, or bitter/sweet; hence, the two basic tastes may be intimately associated features of the same molecule. Stepwise modification at each chiral centre around the sugar ring allows the sapid functions in these molecules to be mapped and leads to the inescapable conclusion that sugar molecules may be 'polarized' on taste bud receptors, so that one end of the molecule elicits sweetness and the other bitterness. However, more extensive chemical modification evidently causes the molecule to realign itself in entirely different ways on the receptor. In most oligosaccharides only one sugar residue is likely to bind to the taste receptor, and this is probably a nonreducing end group, because the anomeric centre of glucopyranose types of structure does not appear to affect sweetness. Sweetness depresses bitterness and bitterness depresses sweetness. Hence, it is not possible to make structural comparisons between analogues without correcting for these effects. However, some semiquantitative studies have established the value of current hydrogen bond theories of sweetness and the ideal oxygen-oxygen interorbital spacings for sweetness criteria in sugar molecules. AS

54

Immobilized enzyme technology.

Weetall, H. H.

Cereal Foods World 21 (11) 581-584, 586-587 (1976) [20 ref. En] [Corning Glass Works, Corning, New York 14830, USA]

The state of the art of immobilized enzyme food processing is reviewed, with particular reference to glucose isomerase in the production of isomerized syrups, glucoamylase for starch hydrolysis and lactase, used in producing hydrolyzed whey sweeteners. JRR

55

High, higher, highest fructose syrups.

Crocco, S.

Food Engineering International 1 (12) 30-31 (1976) [En]

Consideration is given to the production, properties and uses of corn syrups containing various levels of fructose, ranging from 42% to 90%. A simple flow-sheet outlines the production process for corn syrups (including syrups containing 42, 60 and 90% fructose) used by the Clinton Corn Processing Co. Suggested uses for syrups containing 55-60% fructose include as total replacements for sucrose/medium invert sweeteners in beverages. The attitude of the FDA to high fructose corn syrups is briefly considered. JA

56

[Investigation of Iranian nougat known as 'Ispahan gas.]

Ejlali, M.; Sanbi, M.; Feyz, N.

Fruits 32 (1) 67-70 (1977) [4 ref. Fr] [Fac. d'Agron., Univ. de Tehran, Tehran, Iran]

A sweetener obtained from the dried sap of *Astragalus adscendens* was investigated. It is exuded from the plants after insect wounding and on drying forms small white balls. These are ground and used to produce a type of nougat with ground almonds. Analyses of samples from 3 locations are given. The preparation of nougat involves washing and removal of impurities, heating to 50-60°C with stirring, and addition of almonds and pistachio nuts. RM

57

[Sweetening agent.] Süssstoff.

Wagner, H.; Maierhofer, A. Deutsche Gold- & Silber-Scheideanstalt

German Federal Republic Patent Application 2 521 816 (1976) [De]

The material consists of, or contains, the sodium salt of DL-2-hydroxy-4-methyl valeric acid. It has a high sweetening power, exceeding that of sodium cyclamate, and is free from undesirable taste.

W&Co

58

[Organoleptic study on a new dihydrochalcone sweetening agent.] Sensorische Untersuchung eines neuen Dihydrochalkon-Süßstoffes.

Rajky-Medveczky, G.; Takacs-Palasti, M.; Bolla-Puszta, E.; Szejtli, J.

Nahrung 21 (2) 131-137 (1977) [13 ref. De, en, ru] [Inst. für Lebensmittelkontrolle & Untersuchung, Budapest, Hungary]

Studies on the relative sweetness of the dihydrochalcone sweetener CH-401-Na (1-[2-hydroxy-4(3-sulphopropoxy)phenyl]-3-[3-hydroxy-4-methoxyphenyl]-propanone-1-Na) and 13 other salts of this sweetener were conducted; taste panellists compared the sweetness of solutions of sucrose and of CH-401 salts. The results show that CH-401-Na is approx. 1000 times as sweet as sucrose; other CH-401 salts had relative sweetness values of 750-1150 times that of sucrose. Studies on use of CH-401 salts as sweeteners in foods were conducted. Good results were achieved with lemonades and stewed apples; however, coffee, cola drinks, biscuits or vanilla-flavoured imitation cream products were unacceptable. Studies showed that, in contrast to sucrose, the sweet taste is detected at the back of the tongue and the sides of the mouth; the 'sweetness' sensation persists longer than that of sucrose. This persistent sweetness could be minimized by addition of inorganic salts (NaCl, KCl, K₂HPO₄) to the medium. Good results were achieved with substitution of CH-401-Na for 90% of the sucrose in a lemonade, and addition of 0.2 g NaCl/l. to counteract persistent sweetness. Acute and subacute toxicity studies with rats have failed to show any toxic effects of this new sweetener.

AJDW

59

[Natural sweeteners.] Natürliche vorkommende Süßungsmittel. [Review]

Seidemann, J.

Lebensmittel-Industrie 23 (12) 553-557 (1976) [40 ref. De, en, ru]

A brief review is given of the structure, sweetness, after-tastes, etc. of naturally-occurring compounds of potential use as sweetening agents. Compounds considered include the following: glycyrrhetic acid, from liquorice root; monellin, from *Dioscoreophyllum cumminsii*; stevioside, from Stevia rebaudiana; osladin, from *Polypodium vulgare*; miraculin, from *Synsepalum dulciferum*; thaumatin, from *Thaumatococcus danielli*; mono- and dicaffeoylquinic acids from Jerusalem artichokes; the diterpenoid 4-β-10-α-dimethyl-1,2,3,5,10-hexahydrofluorene-4-α-6-dicarboxylic acid from resin of *Picea* spp.; and dihydrochalcones from citrus fruit. Aspartate esters and dipeptides are also briefly considered. IN

60

Low calorie sweetening composition and method for making same.

Glicksman, M.; Wankier, B. N. General Foods Corp.

United States Patent 4 001 456 (1977) [En]

Aqueous solutions of an edible bulking agent and L-aspartyl-L-phenylalanine methyl ester are spray-dried to yield a rapidly soluble sweetening composition. IFT

61**Sweetening compositions.**

LaVia, A. L.; Hill, J. A. E. R. Squibb & Sons, Inc.

United States Patent 4 001 455 (1977) [En]

The aftertaste of saccharin is masked by the incorporation of dipeptide esters. IFT

62**Soft drink concentrates.**

Doren, G. A. van, Jr.; Doren, F. M. van

United States Patent 4 010 285 (1977) [En]

Aqueous carbonated soft drink concentrate formulations contain a saccharin sweetener and, optionally, natural sugar and CO₂ (1-7 vol./vol. of concentrate). IFT

63

[Glucopyranosido-1,6-mannite, its manufacture and use as sugar substitute.] Glucopyranosido-1,6-mannite, ein Verfahren zu seiner Herstellung sowie seine Verwendung als Zuckeraustauschstoff.

Schiweck, H.; Steinle, G.; Munir, M.; Müller, L.; Gau, W.

German Federal Republic Patent Application 2 520 173 (1976) [De]

Glucopyranosido-1,6-mannite (GPM) is non-absorbable and non-decomposable and therefore a good sugar substitute for diabetics. It is used alone or in combination with other sweeteners or carbohydrates, particularly fructose, xylitol and sorbitol, as a sugar substitute in food and beverages. Neutral aqueous solutions of isomaltulose having a DM content of 50% are catalytically hydrated, and GPM is obtained as the first substance by fractional crystallization. W&Co

64

Monellin, a sweet polypeptide derived from fruit of *Dioscoreophyllum cumminsii*.

Cagan, R. H.; Kare, M. R.; Morris, J. A. United States of America, Trustees of the University of Pennsylvania

United States Patent 3 998 798 (1976) [En]**65**

Xylitol, its occurrence, manufacture and uses.

Anon.

British Food Journal 78 (875) 172-173, 175 (1976) [9 ref. En]

Xylitol is an aliphatic straight chain pentitol; the reduction product of the pentose, xylose. It occurs naturally in small amounts in fruit and vegetables (935 mg/100 g in yellow plums) but is prepared commercially from wood hemicelluloses. Xylitol does not react in the Maillard and caramelization

browning reactions typical of reducing sugars. It is less sweet than sucrose when tasted in conjunction with a number of fruit acids, and may have textural effects due to its crystallization properties; it has no glassy state, and crystallization rates differ from those of sucrose. Possible uses are numerous, and include 1:1 replacement of sucrose in soft drinks, chocolate and confectionery products such as creams and jellies, and incorporation into baked goods and preserves. JRR

66**Resolving the cyclamate question.**

Cooper, P.

Food and Cosmetics Toxicology 15 (1) 69-70 (1977) [12 ref. En] [British Ind. Biol. Res. Ass., Woodmansterne Rd., Carshalton, Surrey SM5 4DS, UK]

A review of the accumulating evidence on cyclamates is presented which seems to favour the view that the mutagenic potential of both cyclamate and its main metabolite CHA, is unlikely to be significant. VJG

67

Process for the manufacture of 6-methyl-3,4-dihydro-1-2,3-oxathiazine-4-one-2,2-dioxide.

Hoechst AG

British Patent 1 452 099 (1976) [En]**68**

[Manufacture of calorie-reduced non-alcoholic sweetened drinks.] Verfahren zur Herstellung kalorienreduzierter alkoholfreier gesüßter Getränke.

Hoppe, K.; Nielebock, C.

German Democratic Republic Patent 124 139 (1977) [De]

A method for manufacture of calorie-reduced lemonades, Cola drinks and other carbonated beverages is described. Sucrose is partially replaced by a mixture comprising a synthetic sweetener (saccharin or cyclamate 10-150 parts by wt.), NaCl (20-500 parts by wt.) and glutamic acid or monosodium glutamate (20-100 parts by wt.). Use of the saccharin-based mixture permits reduction of the calorie content by <60%; the cyclamate-based mixture permits an even greater reduction in calorie content. IN

69

The effect of rootstock and maturity on bitterness in orange juice.

Mahmood, M. S.; Qureshi, M. J.; Chaudhry, M. S.

Pakistan Journal of Scientific and Industrial Research 18 (3/4) 184-186 (1975) [18 ref. En]

[Dep. of Food Tech., Univ. of Agric., Lyallpur, Pakistan]

The effects of rootstock and maturity on the bitterness, limon content, acidity, pH, ascorbic acid and total soluble solids (TSS) of orange juice were

determined. Tabulated results showed decreasing limon contents in juice of Jaffa oranges on 2 rough lemon, 2 sour orange and 2 sweet lemon rootstocks, and decreasing limonin contents and acidity, and increasing ascorbic acid and TSS in juice of Valencia oranges with maturity at harvest (Dec. to March): limonin contents fell from 6.2 to 0.9 ppm and acidity from 1.38 to 0.69%, ascorbic acid increased from 63.0 to 70.0 mg/100 ml, and TSS from 7.0 to 8.5%. Organoleptic evaluation confirmed the analytical results. Juices with higher limonin contents were rated lower in acceptability. RM

70

Determination of saccharin in soft drinks by a spectrophotometric method.

Tanaka, A.; Nose, N.; Suzuki, T.; Kobayashi, S.; Watanabe, A.

Analyst 102 (1214) 367-370 (1977) [10 ref. En]
[Saitama Inst. of Public Health, Kamiokubo-Higashi 639-1, Urawa, Saitama, Japan]

Saccharin reacts quantitatively with phenothiazine (thiodiphenylamine) and copper(II) acetate dissolved in 50% v/v ethanol at 70°C. The reaction product can be dissolved in an organic solvent and has a characteristic colour. The colour reaction is sensitive and the absorbance, at 510 nm, of the extract in 5 ml xylene obeys Beer's law at saccharin concn. between 20 and 400 µg/ml. Cyclamates, sorbic acid, benzoic acid, 4-hydroxybenzoic acid and dehydroacetic acid do not interfere. Recoveries of saccharin from soft drinks (apple, lemon, orange and carbonated drinks, and cola) were satisfactory, averaging 99.5% (range 95.7-103.6%). A procedure suitable for routine use is proposed. AS

71

Sweeteners and enhancers. [Book]

Pintauro, N. D.

Food Technology Review, Noyes Data Corporation
No. 40, xi + 392pp. ISBN 0-8155-0652-X (1977)
[En] Park Ridge, New Jersey, USA; Noyes Data Corporation

This book is based on US patents that deal with sweeteners and sweetness enhancers and their commercial technology. 11 British patents have been included to complete the technological picture. The information is arranged under the following headings: Miraculin, glycyrrhizin and artichoke sweeteners (pp. 3-34); Dipeptides (pp. 35-60) including aspartic acid alkyl esters, α-L-aspartyl derivatives; Chalcones and maltols (pp. 61-90) including flavanone glycoside dihydrochalcones, hesperetin dihydrochalcone; Other synthetic sweeteners (pp. 91-142) including diacetone glucose, saccharin amine salts, tryptophan derivatives, substituted tetrazoles, 8,9-epoxyperillartine sweeteners, 5-imino-4,4-dimethyl-2-imidazolidinone, kynurenone derivatives, heliotropyl nitrile, 2-(3-bromopropoxyl)-S-nitroaniline, 3-amino-4-n-

propoxybenzyl alcohol, PMCA, special oximes, stevioside, maltitol and lactitol sweeteners; Saccharin combinations and special formulations (pp. 143-178); Methods for increasing bulk of mixes (pp. 179-241); Sugar substitutes and speciality ingredients (pp. 242-287); Drinks, jellies, fruits and chewing gum (pp. 288-349); and Desserts and baked goods (pp. 350-385). Company, inventor and US patent number indexes are included. VJG

72

Edibles sweetened with flavanones.

Dawson, D. J.; Otteson, K. M.; Seitz, T. Dynapol Corp.

United States Patent 4 013 801 (1977) [En]

Foods are sweetened by incorporation of flavanones with a $-(CH_2)_n-SO_3M$ chain linked through the carbonyl group in the 4 position, n being 1 to 3 and M is a metal cation or hydrogen, together with an alkyl group of 1 to 3 carbons at the 4' position. The general structural formula is given. ELC

73

[Synthetic sweeteners.]

Pallotti, G.

Industria Alimentari 16 (4) 91-93 (1977) [19 ref. It]

In view of recent comments on the potential health hazard of saccharin, the current position with regard to the use of artificial sweeteners in Italy (where there is a virtual ban) and the problem of differentiating between sweeteners and additives are discussed. Additionally, the background to the ban by the US authorities on some specific sweeteners (Dulcina, Sucrol, P-4000, Ultra Süss, cyclamates, Sucaryl) is also outlined. HBr

74

Saccharine and its salts. Proposed rule and hearing.

United States of America, Food & Drug Administration

Federal Register 42 (73, April 15) 19996-20010 (1977) [En] (Washington, DC, USA)

The history of use and safety of saccharin, with emphasis on recent carcinogenic studies and an assessment of human risk, is reviewed. It is concluded that saccharin poses a significant risk of cancer for humans and must be banned as a food additive. However, it may be approved for individuals, including diabetics, who must limit their intake of carbohydrates. CAS

75

[Function and position of sugars in confectionery.]

Funktion und Stellenwert des Zuckers in

Süßwaren. [Review]

Krüger, C.

Zeitschrift für die Zuckerindustrie 27 (5) 298-302 (1977) [14 ref. De, en, es, fr] [Vereinigte Couleur-

& Sirupfabriken J. J. Reinboth & J. L. F. Lau GmbH,
Segeberger Strasse 5, 2406 Stockelsdorf bei
Lübeck, Federal Republic of Germany]

This review discusses the consumption of sugar and confectionery in EEC countries and the quantities, quality, types and technological functions of sugar in confectionery products. About 33% of the industrially consumed sugar is used by the confectionery industry, where its physico-chemical properties (solubility, viscosity, recrystallization) can not be replaced by other sweeteners. Glucose syrups and other sweeteners have only limited applications. Xylitol deserves attention as a sweetener for diabetic products.

RM

76

Saccharin ban goes beyond the issue of cancer.
Lepkowski, W. C.

Chemical and Engineering News 55 (15) 17-21 (1977) [En]

Information on the safety/toxicity of saccharin (now banned by the FDA) is reviewed briefly. The history of saccharin (discovered in 1879) is summarized. The role of sugars in the diet is also questioned. AL

77

[Transformation of dextrose to fructose.]
Anon.

Revue de la Conserve Alimentation Moderne No. 46, 79-80, 82 (1976) [Fr]

The growth of isomerase production in the USA, Japan, Netherlands and UK is reviewed and details are given of the continuous KSH process (Royal Scholten-Honig, Koog a/d Zaan, Netherlands). Moisture-conditioned maize is milled to separate the starch, which is subjected to enzyme treatment in aqueous suspension to produce the basic substrate of glucose syrup (98 DE), which is filtered, decolorized and conc. This solution is passed through a column of immobilized isomerase enzyme to transform part of the dextrose to fructose (the degree can be varied by rate of flow and temp. and can be automatically controlled). The isomerized solution is purified and evaporated to a desired consistency. A standard product contains 70-72% DM (made up of 42% fructose, 55% dextrose, 3% polysaccharides), with pH 4.0 and equal sweetening power to sucrose. It is colourless, odourless, neutral in flavour, easily pumped at 27-32°C, immune to microbiological action (high osmotic pressure), and valuable for preventing sugar crystallization. Advantages of its use are described in relation to non-alcoholic drinks, fruits in syrup, jams (preventing syneresis), bakery products (rapid dough raising, moisture retention, crust colour), soft confectionery, and milk desserts. Other cereal products (e.g. potatoes, rice) can be processed. ELC

78

Taste intensity, pleasantness and quality of aspartame, sugars, and their mixtures.

Moskowitz, H. R.; Dubose, C.

Canadian Institute of Food Science and Technology Journal 10 (2) 126-131 (1977) [23 ref. En, Fr]
[MPI Sensory Testing Inc., 770 Lexington Avenue, New York, New York 10021, USA]

Panellists evaluated unmixed aqueous solutions of aspartame and 3 sugars (glucose, fructose, sucrose) at different levels as well as aspartame-sugar mixtures (by the method of magnitude estimation) for sweetness, pleasantness, and overall qualitative dissimilarity to sucrose solutions. Each unmixed sweetener produced sweetness functions conforming to power equations. Mixture sweetness of aspartame with all 3 sugars could be predicted from a linear combination of component sweetenesses. Pleasantness was approx. an inverted U or L shaped function of sweetness. Dissimilarity to sucrose 'flavour' was max. for mixtures which comprised substantial amounts of aspartame relative to the sugar. AS

79

The US market for high-fructose corn syrup.
Keim, C. R.

Sugar y Azucar 72 (5) 59-60, 62-63, 109-110, 112, 114 (1977) [En, Es]

This discussion of likely developments in the relative importance of sucrose and of high-fructose corn syrup (HFCS) in the USA market covers: details of the technology of HFCS manufacture; the potential for second-generation HFCS with an increased fructose content; utilization of by-products of HFCS manufacture; and the relative costs of sucrose and HFCS. AJDW

80

A rapid method for detection of aflatoxins from xylitol.

Niskanen, A.; Lindroth, S.; Pensala, O.

European Journal of Applied Microbiology 2 (4) 307 (1976) [En] [Tech. Res. Cent., Finland Food Res. Lab., Biologinkuja 1, SF-02150 Espoo 15, Finland]

A sensitive method was developed for the detection of aflatoxins B₁, B₂, G₁ and G₂ in xylitol. Xylitol solutions were extracted with chloroform and dried over anhydrous Na₂SO₄. Dried extract was redissolved in benzene and spotted on activated TLC plates. Quantification of aflatoxins was performed either visually under UV light (365 nm) or fluorodensitometrically. Results showed that recovery of aflatoxins B₁ and G₁ was on average 64.0 and 75.0%. The sensitivity of the method was about 1.0 µg/kg xylitol. CRI

81

Effervescent dipeptide sweetener tablets.

Finucane, T. P. General Foods Corp.

United States Patent 4 009 292 (1977) [En]

A combination of a readily soluble form of L-aspartyl-L-phenyl methyl ester (APM) and an effervescent calcium carbonate system with citric produces, when compressed into tablet form, an effervescent APM tablet having superior solubility and stability, and is devoid of characteristics lingering after-taste. AS

82

Low calorie sweetener.

Glicksman, M.; Wankier, B. N. General Foods Corp.

United States Patent 4 007 288 (1977) [En]

Rapid dissolving sweetening compositions are formed by vacuum drying an aqueous solution of an edible bulking agent and L-aspartyl-L-phenylalanine methyl ester. IFT

83

[Artificial sweetener.]

Morita Kagaku Kogyo Co. Ltd.

Japanese Patent 5 201 980 (1977) [Ja]

The sweetness of glycyrrhizin components is increased by the addition of an extract of Stevia rebaudiana Bertoni. IFT

84

Sweetening compositions.

Huber, U.; Kosslakoff, N.; Vaterlaus, B.

United States Patent 4 001 453 (1977) [En]

The sweetening mixture, consisting, in one example, of 30 mg neohesperidin dihydrochalcone and 0.4 g D(+) gluconic acid δ -lactone, has been used for sweetening raspberry yoghurt. EJM

85

[Use of 2,5-dimethyl-3-hydroxy-4-oxo-4,5-dihydrofuran as sweetening agent.]

Firmenich SA

Swiss Patent 585 524 (1977) [Fr]

2,5-dimethyl-3-hydroxy-4-oxo-4,5-dihydrofuran is used as a sweetening agent to reinforce the sweetness of foods and drinks containing sugar. It can replace up to 15% of the sugar content. W&Co

86

[Sweetening composition.] Süssstoffkomposition.

L. Givaudan & Cie SA

Swiss Patent 536 022 (1977) [De]

An artificial sweetener consists of a mixture of (a) glucono- δ -lactone and (b) a dihydrochalcone such as neo-hesperidin-dihydrochalcone, naringindihydrochalcone or hesperetindihydrochalcone-glucoside, as indicated in a basic structural formula. These may be used in milk products, fruit drinks, bakery products, sweets, chewing gum, etc. W&Co

87

Health laws and regulations - Lebanon.

World Health Organization

International Digest of Health Legislation 28 (1)

70-73 (1977) [En] [Geneva, Switzerland]

A selection of Lebanese health laws and regulations is presented including the following which relate to food hygiene: Decree No. 1781 of 1 Sept., 1971, for the enforcement of the Emergency Bill on the addition of potassium iodide or potassium iodate (at 10-15 mg I per kg of pure dehydrated salt) to table or cooking salt; Order No. 148/1 of 8 April, 1972, of the Minister of Public Health on the import of saccharin and cyclamates, which prohibits the import, manufacture, and export of cyclamic acid and its salts, as well as all pharmaceutical products, foodstuffs, and beverages sweetened with such products; and which makes the import, manufacture, export and packaging of saccharin and its salts in powder form or in other pharmaceutical products, subject to a special licence; and Order No. 3247 of 22 April, 1972, of the Higher Board of Customs revoking all orders regulating the import of saccharin and saccharyl that are not in conformity with the provisions of Order No. 148/1 of 8 April, 1972. VJG

88

Health laws and regulations - Finland.

World Health Organization

International Digest of Health Legislation 27 (2)

321-339 (1976) [En] [Geneva, Switzerland]

A selection of Finnish health laws and regulations is presented including the following which relate to food hygiene: Ordinance No. 197 of 20 March, 1975, amending Sections 27a, 28, and 56 of the Foodstuffs Ordinance; Decree No. 310 of 8 April, 1975, of the National Board of Trade and Consumer Interests amending the first and second paragraphs of Section 8 of the Decree on permitted food additives prescribes that xylitol is added to the list of permitted sweeteners (for use in pastilles and chewing-gum only, as well as in foods for special dietary uses) and that the packaging of foodstuffs to which sorbitol or xylitol have been added as sweeteners must carry an indication to this effect; Decree No. 300 of 30 April, 1975, of the Ministry of Agriculture and Forestry on milk inspection repeals various texts, including Decree No. 157 of 18 March, 1966, and makes provisions relating to the following: the production of milk on farms, transportation of milk from farms, transportation of milk from reception centres to milk-processing establishments, general provisions concerning milk-processing establishments, rules governing milk products, retail distribution of milk products, and sanitary surveillance; and Decree No. 453 of 4 June, 1975, of the Ministry of Agriculture & Forestry on milk testing, repeals Decree of 15 June, 1973, on the taking and testing of milk samples. VJG

89

[Enzymic determination of D-sorbitol and xylitol in foods.] Enzymatische Bestimmung von D-Sorbit und Xylit in Lebensmitteln.

Beutler, H. O.; Becker, J.

Deutsche Lebensmittel-Rundschau 73 (6) 182-187 (1977) [20 ref. De, en, fr] [Forschungslab., Boehringer Mannheim GmbH, Biochemica Werk Tutzing, 8132 Tutzing, Federal Republic of Germany]

A rapid enzymic method for detn. of sorbitol and xylitol in foods is described. Sorbitol is specifically oxidized to fructose by sorbitol dehydrogenase in the presence of NAD⁺. The NADH formed is eliminated by means of lactate dehydrogenase, and the fructose is determined by the hexokinase method. Total sorbitol + xylitol concn. is determined by oxidation by sorbitol dehydrogenase to fructose and xylulose respectively in the presence of NAD⁺; the NADH formed reduces iodine nitro-tetrazolium chloride to a formazan, the extinction value of which is determined at 492 nm. Xylitol concn. may then be calculated from the difference between the determined sorbitol and sorbitol + xylitol concn. Little or no interference by sugars, alcohols, other polyols or heavy metals occurs. Reducing substances (e.g. ascorbic acid) interfere when present at high concn. Accuracy and recovery were good. Application of this method to detn. of sorbitol and xylitol in dietetic products (jams, honey, bakery products, chocolate, wines, fruit juices) is briefly discussed. AJDW

90

Jungle fruits to satisfy the sweetest tooth.

Warinton, A.

Farmers Weekly 85 (18) ii, v (1976) [En]

The use of the protein sweeteners thaumatin and monellin, derived, respectively from katemfe and serendipity berries, is briefly mentioned. These proteins have several thousand times the sweetening power of sucrose and could be used in dietary (e.g. diabetic) foods where non-carbohydrate sweeteners are necessary. Their disadvantage is that their sweetness is destroyed by cooking, as the protein becomes denatured. DMA

91

A high-pressure liquid chromatographic method for the quantitation of neohesperidin dihydrochalcone. Fisher, J. F.

Journal of Agricultural and Food Chemistry 25 (3) 682-683 (1977) [5 ref. En] [Florida Dep. of Citrus, Univ. of Florida, IFAS, Lake Alfred, Florida 33850, USA]

Neohesperidin dihydrochalcone (a non-nutritive sweetening agent) was resolved from filtered grapefruit juice by high-pressure liquid chromatography using a micro C-18 column and eluting with a water-acetonitrile system. Detection was accomplished at 280 nm. The method is linear over the range 2-20 ppm. AS

92

Status of sweeteners for soft-serve products.

Moroz, R. D.; Troy, J. P.

American Dairy Review 39 (5) 36R, 36T, 36V, 36X (1977) [11 ref. En] [Sandstone Building, Mount Morris, Illinois 61054, USA]

Various sugars (sucrose, dextrose, invert sugar, fructose and maize syrup) which are used in the dairy and frozen dessert industry are briefly dealt with and the availability and economics of these sweeteners are considered. JL

93

Carbohydrate sweeteners. [Lecture]

Nicol, W. M.

Chemistry and Industry No. 11, 427-431 (1977) [9 ref. En] [Tate & Lyle Ltd., Philip Lyle Memorial Res. Lab., Reading, Berks., UK]

Some properties and uses of sucrose, glucose syrups, high fructose glucose syrup, fructose, xylitol, lactose, lactitol, sorbitol, lycasin and maltose are briefly discussed. [See FSTA (1977) 9 11G810.] AL

94

Saccharin: a chemical in search of an identity.

Culliton, B. J.

Science, USA 196 (4295) 1179-1180, 1182-1183 (1977) [En]

Comment is made on the debate as to whether saccharin should have been banned by the FDA in the USA, including the need for a definition (as a food additive, or drug), studies with rats, and alleged benefits and risks of saccharin. AL

95

New sweet diterpene glucosides from Stevia rebaudiana.

Kohda, H.; Kasai, R.; Yamasaki, K.; Murakami, K.; Tanaka, O.

Phytochemistry 15 (6) 981-983 (1976) [11 ref. En] [Inst. of Pharmaceutical Sci., Hiroshima Univ. School of Med., Kasumi 1-2-3, Hiroshima-shi, Japan]

From the leaves of Stevia rebaudiana, 2 new sweet glucosides, rebaudiosides A and B, were isolated besides the known glucosides, stevioside (one of the sweetest natural products known) and steviolbioside. On the basis of IR, MS, ¹H and ¹³C NMR as well as chemical evidences, the structure of rebaudioside B was assigned as 13-O-[β-glucosyl(1-2)-β-glucosyl(1-3)]-β-glucosyl-steviol and rebaudioside A was formulated as its β-glucosyl ester. AS

96

Isolation and identification of phyllodulcin and skimmin from the cultured cells of amacha (*Hydrangea macrophylla* seringe var. *Thunbergii* makino).

Suzuki, H.; Ikeda, T.; Matsumoto, T.; Noguchi, M.

Agricultural and Biological Chemistry 41 (4) 719-720 (1977) [9 ref. En] [Cent. Res. Inst., Japan Tobacco & Salt Public Corp., Umegaoka 6-2, Midori-ku, Yokohama 227, Japan]

97

Artificial sweeteners.

Crosby, G. A.; DuBois, G. E. Dynapol
United States Patent 3 976 687 (1976) [En]

Dihydrochalcone derivatives are obtained by replacing one hydrogen with a linear polyether in the methylene link between the oxy bridge of the A ring and a polar carboxylic acid group, and substituting a low alkyl group (1-4 carbon) in the B ring. Structural formula is given. ELC

98

[New assessment of sweeteners.]

Dupaigne, P.

Fruits 32 (2) 117-136 (1977) [227 ref. Fr, de, en, es, ru] [IRFA, 6, rue du General Clergerie, 75116 Paris, France]

The literature on sweeteners is brought up-to-date, with sections on general work on the "sweet" taste or on several natural and synthetic sweet materials; various opinions on cyclamates; saccharine; dipeptides; dihydrochalcones; possible synthetic sweeteners; known glucides (glucose, levulose or fructose, sugar alcohols); and natural sweeteners (from Glycorrhiza, Synsepalum, Dioscoreophyllum, Thaumatococcus, Momordica grosvenori). Dipeptides and high-fructose syrups are extensively discussed, as well as a synthetic ester with extraordinary sweetening power and a cucurbitaceous plant containing a fairly powerful sweetener. [See also FSTA (1973) 5 8T402.] RM

99

Health laws and regulations - Australia.

World Health Organization

International Digest of Health Legislation 27 (1) 6-29 (1976) [En] [Geneva, Switzerland]

A selection of health laws and regulations is presented, including the following which relate to food hygiene: New South Wales - Pure Food Act, 1908 - regulations (dated 18 Dec., 1974) - regulations 1 and 1A are replaced by a new version of regulation 1 laying down general provisions dealing with the labelling of foods; Pure Food Act, 1908 - regulations (dated 18 Dec., 1974) a new regulation 6 (Residues of pesticides and drugs in foods) is introduced; Queensland - Pure Food Act, 1908 - regulations (dated 22 Jan., 1975) - lay down standards for various categories of vinegar; Pure Food Act, 1908 - regulations (dated 22 Jan., 1975) prescribe that saccharin and cyclamate may be added in the proportions indicated to brewed soft drinks, and introduces a definition of 'smoke flavour'; Pure Food Act, 1908 - regulations (dated 26 Feb., 1975) inserts new provisions relating to the labelling of polyunsaturated fats and oils; Food Hygiene Regulations of 1974 (dated 11 July,

1974), repeal the Health (Food Hygiene) Regulations of 1957 and are intended to ensure that hygienic standards are maintained in food establishments; South Australia- Dairy Industry Regulations, 1974 (dated 8 Aug., 1974) which constitute a consolidation of Regulations made under the Dairy Industry Act 1928-1972, notably those published on 27 Sept., 1962; [Continued in following abstr.] VJG

100

Saccharin and its salts.

United States of America, Food & Drug Administration

Federal Register 42 (127, July 1) 33768-33770 (1977) [En] [Washington DC, USA]

A summary and discussion are given of 2 recent studies on the safety of saccharin for human consumption, one of which indicates a positive dose-and duration-related correlation between saccharin use and cancer of the bladder in human males. CAS

101

[Toxicological problems caused by use of synthetic sweeteners in food.] [Review]

Fondu, M.

Agricultura, Belgium 24 (3) 213-246 (1976) [30 ref. Fr] [Inst. d'Etudes Europeennes, Univ. Libre de Bruxelles, Brussels, Belgium]

102

Salts of dihydrochalcone derivatives and their use as sweeteners.

Westall, E. B.; Messing, A. W. (Nutrilite Products Inc.)

United States Patent 4 031 260 (1977) [En]

Foods and beverages, particularly soft drinks, are sweetened by incorporation of mono basic metal salts of a specified dihydrochalcone, e.g. neohesperidindihydrochalcone. IFT

103

Method of reducing bitterness in citrus juices.

Guadagni, D. G.; Horowitz, R. M.; Gentili, B.; Maier, V. P. (**United States of America, Secretary of Agriculture**)

United States Patent 4 031 265 (1977) [En]

The bitterness of navel orange juice is reduced by addition of 100 ppm neodiosmin. IFT

104

Process for sweetening substances with sweetening agent capable of preventing dental caries.

Hayashibara Seibutsu Kagaku Kenyusho Co. Ltd.

British Patent 1 471 613 (1977) [En]

Foods are sweetened by incorporation of a starch syrup or powder containing oligo- or polyglucosyl fructose, a sweetener said to prevent the formation of dental caries. IFT

105

Process for preparing nutritive sweetening compositions.

Lugay, J. C.; Feldman, J. R. (General Foods Corp.)

United States Patent 4 031 259 (1977) [En]

An aqueous solution of a dipeptide nutritive sweetener is co-dried with a bland low mol. wt. polypeptide. IFT

106

Sweetening with hydrohalide salts of dipeptide sweeteners.

Haas, G. J.; Berg, J. H. (General Foods Corp.)

United States Patent 4 029 701 (1977) [En]

Hydrohalide salts of dipeptide sweeteners e.g. L-aspartyl-L-phenylalanine methyl ester hydrochloride, are incorporated into dry food and beverage mixes for quick reconstitution with water, particularly carbonated beverages where no mixing can be tolerated. A dry system is necessary to prevent hydrolysis of the salts. GL

107

[Isolation of microorganisms capable of formation of xylose isomerase and xylitol dehydrogenase.]

Menezes, H. C. de; Biasioli, P. C.

Coletanea do Instituto de Tecnologia de Alimentos 7 (2) 385-388 (1976) [6 ref. Pt, en] [Inst. de Tecnologia de Alimentos, Av. Brasil 2880, Caixa Postal 139, Campinas, Sao Paulo, Brazil]

74 strains of bacteria (capable of using xylose as the sole C source) were screened for xylose isomerase and xylitol dehydrogenase activity. Of these, 4 showed good and 3 excellent xylose isomerase activity; 6 showed good and 1 excellent xylitol dehydrogenase activity. Only 1 strain showed good activity of both enzymes studied. These results are discussed in relation to preparation of xylitol (for use as a sweetener in dietetic foods) by enzymic conversion of xylose. AJDW

108

[Use of agricultural by-products for production of xylitol. I. Production of xylose.]

Menezes, H. C. de; Beber, J. E.; Pereira, W. A.

Coletanea do Instituto de Tecnologia de Alimentos 7 (2) 439-445 (1976) [11 ref. Pt, en] [Inst. de Tecnologia de Alimentos, Av. Brasil 2880, Caixa Postal 139, Campinas, Sao Paulo, Brazil]

69 strains of fungi were screened for xylanase activity; 9 showed good and a further 3 showed excellent xylanase activity. The highest xylanase activity was recorded for a strain of Rhizopus isolated from soil. Experiments showed that xylanase of this species may be isolated by precipitation with acetone, without adversely affecting its activity. This xylanase released xylose from corn cobs, rice husks or wheat bran, without prior extraction of the xylan. These results are discussed in relation to manufacture of xylose for subsequent conversion to xylitol (for use as a sweetening agent in dietetic foods). AJDW

109

Dihydrochalcone sweeteners. Synthesis and sensory evaluation of sulfonate derivatives.

DuBois, G. E.; Crosby, G. A.; Stephenson, R. A.; Wingard, R. E., Jr.

Journal of Agricultural and Food Chemistry 25 (4) 763-772 (1977) [48 ref. En] [Chem. Synthesis Lab., Dynapol, Palo Alto, California 94304, USA]

15 sulphonate analogues of hesperetin dihydrochalcone (DHC), the aglycone portions of the intensely sweet glycosidic flavonoid neohesperidin DHC, were prepared and subjected to sensory analysis. 3 distinct synthetic routes, the most general of which involves the regioselective alkylation of hesperetin at the 7 position followed by alkaline hydrogenation, were developed for the preparation of these materials. The simple linear 4-O-sulphoalkyl-DHC derivatives exhibited taste properties comparable to neohesperidin DHC. These sulphonates were found, however, to exhibit a slow taste onset followed by a lingering aftertaste as appears typical for DHC sweeteners. Taste-timing properties are discussed from the viewpoint of modern sensory theory, and a model speculating on the various aspects of the DHC molecule responsible for the observed taste was developed. AS

110

Artificial sweetener.

Chimicasa GmbH

British Patent 1 470 603 (1977) [En]

Saccharin and cyclamate sugar substitutes contain food acid salts as filling agents. IFT

111

[Artificial sweetening agents.]

Iran, Institute of Standards & Industrial Research of Iran

Iran Standard ISIRI 1302, 14pp. (1975) [Pe]
[PO Box 2937, Tehran, Iran]

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